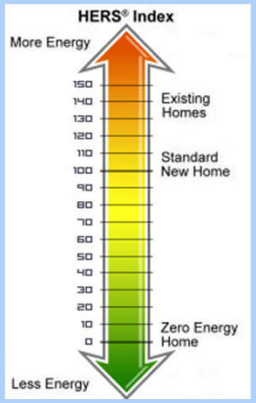
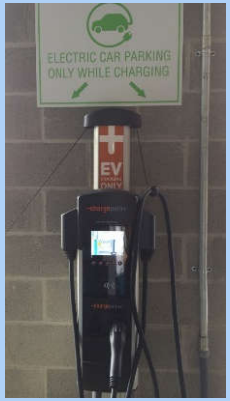
The Ithaca Energy Code Supplement

May 3, 2022





Basics of the Ithaca Energy Code Supplement (IECS)

Overview

- Code requirements for new buildings and major renovations
- Overlays NYS energy code
- Focus on GHG emissions reduction, affordability, electrification, and renewable energy
- Adopted in City of Ithaca and Town of Ithaca
- Went into effect in 2021
- Not to be confused with City of Ithaca electrification project

Applicability

- New Construction
  - If more than 50% of the heated floor area is residential, then building must meet residential requirements
  - Otherwise meet commercial requirements
- Additions
  - Single family and duplex: additions ≥ 500 sq ft
  - All other buildings: additions ≥ 1,000 sq ft
- Major Renovations
  - Work area is at least 75% of the building floor area AND
  - At least two of the following major energy components are substantially renovated: heating, lighting, and envelope
  - Entire building must comply, not just renovation work area

Current and Future Code Cycles

- 2021: 40% reduction in GHG emissions compared to state code and local practices
- 2023: Requirements increase; 80% GHG reduction
  - Wait, is that *next year*?!? Um, *yes*!
- 2026: Requires net-zero carbon building and no fossil fuel usage in building*
  - Cooking and process energy may use FF
- Must also comply with all NYS codes

Permitting and Inspection

Compliance must be shown at each stage of the development process

- At the planning review phase, a preliminary green building checklist must be submitted.
- Prior to the building department issuing a building permit, a checklist and supporting documents must be submitted with the construction documents.
- If inspection shows that the building is not built to plan, no certificate of occupancy is issued.

How did we get here?

How did we get here?

Summer 2015
Green Building Policy Project Conceived

→

Spring 2016
Applied for funding (again)

→

Spring 2017
Engaged consultants, Project kick-off

↓

Summer 2017
2-day Peer Learning Exchange

→

Spring 2018
Green Building Policy report

→

2017-2021
Public Outreach

↓

Summer 2019
Ithaca Energy Code Supplement Draft

→

2019/2020
Green New Deal adopted by City/Town

→

Spring 2021
Ithaca Energy Code Supplement adopted

LET'S CELEBRATE!

Northstar House (outside), 202 E Falls St.
Thursday, June 17, 5:30 pm - 7:00 pm+
Food and drink available for purchase
First drink free if you walk, bike, bus, or roll

The **City of Ithaca** just passed a law requiring all **new construction** to be **net-zero by 2026**. The **Town of Ithaca** is considering adoption June 14. Ithaca now has the **strongest energy code** in New York. Learn more at www.ithacagreenbuilding.com.

Free drinks made possible by generous donations from:

STREAM COLLABORATIVE architecture + landscape architecture dpc
ITHACA 2030 DISTRICT
TC CPI Tompkins County Climate Protection Initiative
Taitem

The architects of the IECS: Nick Goldsmith (Town/City of Ithaca), Noah Demarest (Stream), Ian Shapiro (Taitem)

Overview of Requirements

Requirements

Two compliance options

Prescriptive
Easy Path

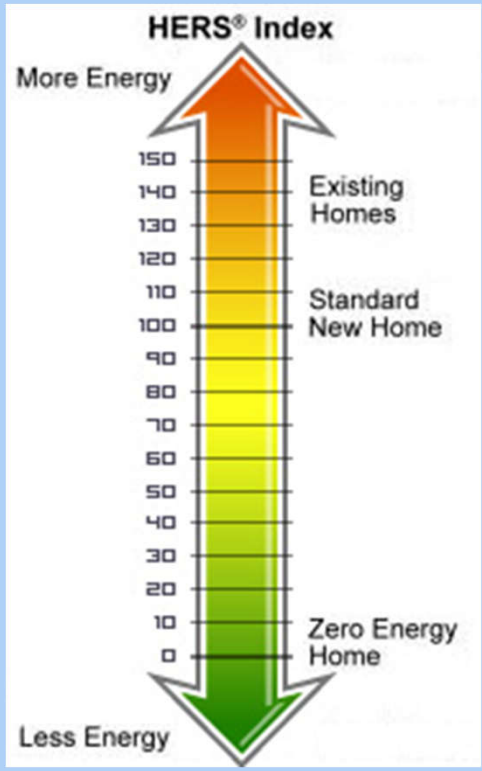
- Point system
- Achieve minimum of 6 points
- Easy to use
- Emphasis on affordability and electrification

Performance-Based
Whole Building Path

- Allows more flexibility in building design
- Must comply with a high-performance building standard or use energy modeling
- Certification is not necessary

Whole Building Path Overview

- Allows more flexibility in building design
- Must comply with requirements based on third-party green building standards. Certification is not necessary.
  - LEED (minimum 17 energy points)
  - Energy Rating Index (HERS Rating max. 40)
  - National Green Building Standard (min. 80 EE points)
  - Passive House
  - GHG Emission Calculation Method (minimum 40% GHG reduction, shown through energy modeling)



Easy Path Overview

- Six points are needed to comply (in 2022)
- Calibration: 6-10% GHG emission reduction per pt.
  - Compared to 2015 NYS Energy Code and local construction
- Point Categories:
  - Efficient Electrification
  - Affordability Improvements
  - Renewable Energy
  - Other Points

Easy Path Overview

Six points are needed to comply.

Efficient Electrification		
EE1	Heat pumps for space heating	2 - 5 points
EE2	Heat pumps for service water heating	1 point (Residential, hotel only)
EE3	Commercial Cooking electrification	3 points (Food svc only)
EE4	Residential cooking and clothes drying electrification	1 point (Residential only)
Affordability Improvements		
AI1	Smaller building/room size	1 - 2 points (Residential, hotel only)
AI2	Heating systems in heated space	1 point
AI3	Efficient building shape	1 point
AI4	Right-lighting	1 point (Commercial only)
AI5	Modest window-to-wall ratio	1 point
Renewable Energy		
RE1	Renewable energy system	1 - 3 points
RE2	Biomass system for space heating	3 - 5 points
Other Points		
OP1	Development Density	1 point
OP2	Walkability	1 point
OP3	Electric Vehicle Parking Spaces	1 - 2 points
OP4	Adaptive reuse	1 point
OP5	Meet NY Stretch Energy Code	1 - 2 points
OP6	Custom energy Improvement	1 - 2 points

Efficient Electrification

EE1 Heat pumps for space heating

Electric heat pumps are more energy efficient than fossil fuel based space heating equipment.

Requirement:
Heat pumps for space heating; no fossil fuels used for HVAC system.

Possible Points: 2-5
2 points (Commercial) or 3 points (Residential) for air source heat pumps.

3 points (Commercial) or 5 points (Residential) for ground source heat pumps.

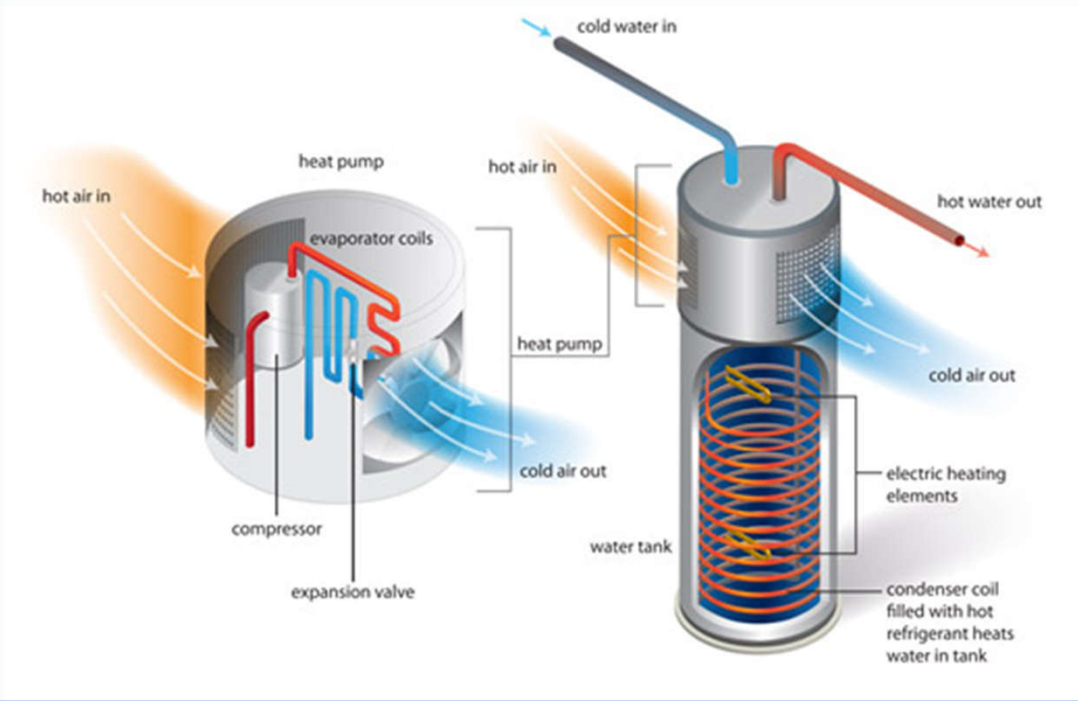
Efficient Electrification

EE2 Heat pumps for water heating

Electric heat pumps are more energy efficient than fossil fuel based water heating equipment.

Requirement:
Water heating systems that use heat pumps.

Possible Points: 1
Residential and other buildings with substantial hot water usage only.



Efficient Electrification

EE3 Commercial cooking electrification

Electric cooking equipment produces fewer GHG emissions than fossil fuel based equipment.

Requirement:
Only electric cooking equipment in restaurants and other food service buildings that have commercial kitchen hoods. Prerequisite: no fossil fuels in the building.

Possible Points: 3
Restaurants and food service only.

Efficient Electrification

EE4 Residential cooking and clothes drying electrification

Electric stoves and heat pumps clothes dryers produce fewer GHG emissions than fossil fuel based equipment.

Requirement:
Electric stoves AND ventless heat pump clothes dryers.
Prerequisite: no fossil fuels in the building.

Possible Points: 1
Residential only.

Affordability Improvements

AI1 Smaller building/room size

Smaller buildings use less energy and cost less. The impact on energy use is almost linear, due to energy uses that scale with size, like heating, cooling, lighting, etc.

Requirement:
Building size is smaller than the thresholds identified in the tables.

Possible Points: 1 - 2
1 point for 15% smaller than reference size.
2 points for 30% smaller.
Residential and Hotels only.

Size Allowances for Single Family Dwellings, Two-family Dwellings, and Townhouses

Number of Bedrooms	1	2	3	4	5	6	7 or more
Maximum home size allowed to receive one point (SF)	850	1,360	1,870	2,380	2,890	3,400	+510 for each additional bedroom
Maximum home size allowed to receive two points (SF)	700	1,120	1,540	1,960	2,380	2,800	+420 for each additional bedroom

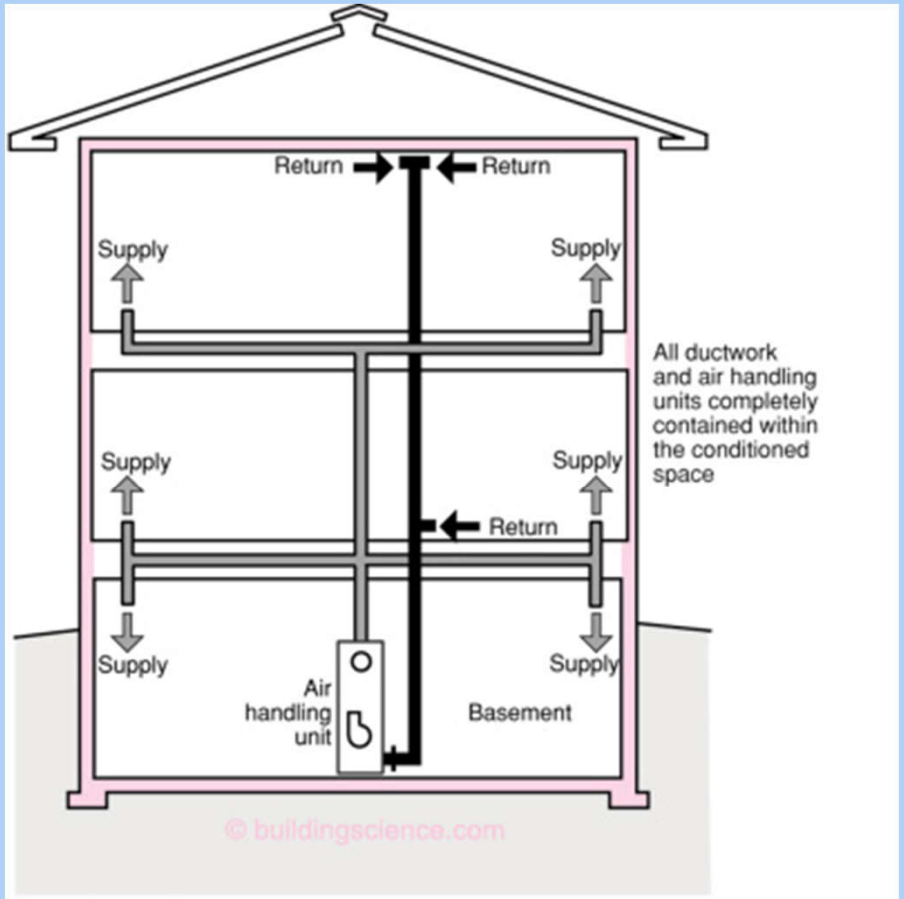
Affordability Improvements

AI2 Heating systems in heated space

Siting heating equipment, including ductwork, outside the heated space is less efficient than capturing the heat loss within the heated space.

Requirement:
Place heating/cooling systems and distribution inside directly heated and occupiable space.

Possible Points: 1

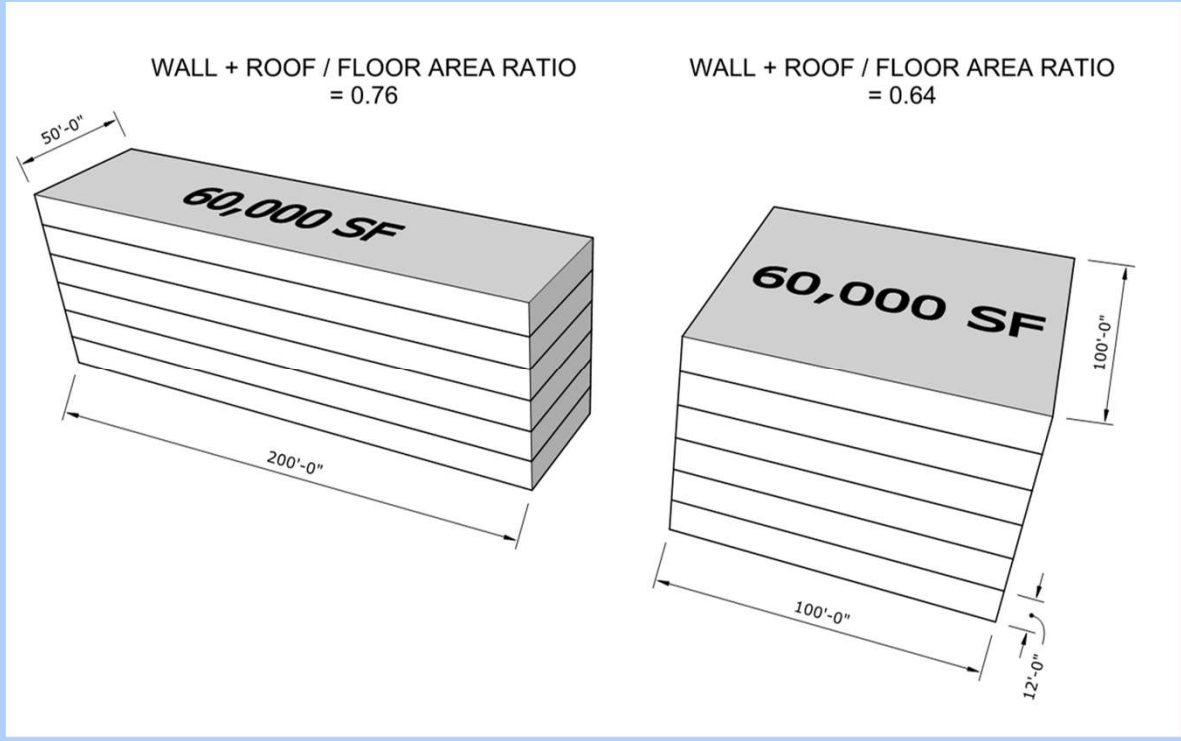


Note: Colored shading depicts the building's thermal barrier and pressure boundary. The thermal barrier and pressure boundary enclose the conditioned space.

Affordability Improvements

AI3 Efficient building shape

Compact building forms are more energy efficient than sprawling forms because of the reduced surface area of the thermal envelope relative to the amount of floor area.



Requirement:
The exterior surface area divided by gross floor area is less than the maximum value provided in the reference table.

Possible Points: 1

Affordability Improvements

AI4 Right-lighting

Overlighting can waste unnecessary energy.

Requirement:
Lighting power density 50% below energy code; Lighting controls; Commissioning.

Possible Points: 1
Commercial only.

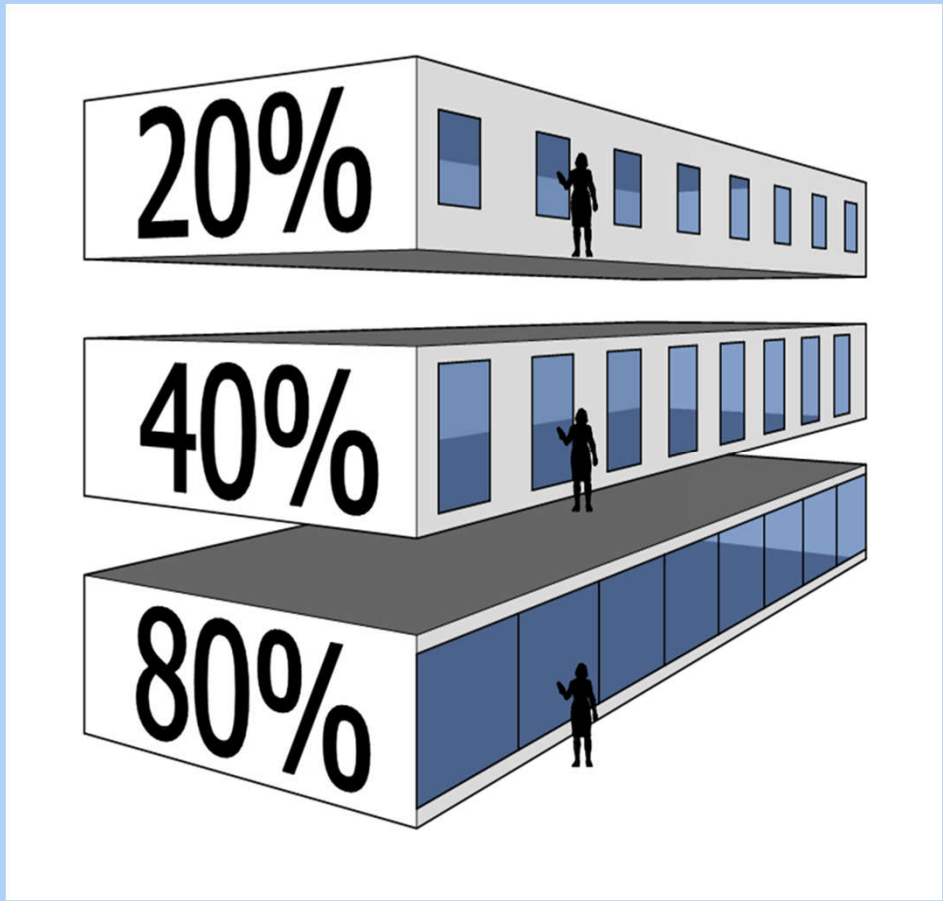
Affordability Improvements

AI5 Modest window-to-wall ratio

Windows that are larger than necessary to provide access to views and natural daylight significantly increase energy use for both heating and cooling.

Requirement:
Overall window-to-wall ratio less than 20% (individual spaces may exceed 20%).

Possible Points: 1



Window to Wall Ratio Example

Sustainable Living Center at EcoVillage in the Town of Ithaca

Overall WWR ratio: 16%

Photo Credits: Learn@EcoVillage Ithaca

Renewable Energy

RE1 Renewable energy systems

Renewables such as solar hot water and photovoltaic systems (on-site or off-site) reduce the need for electricity generated by fossil fuels.

Requirement:
Install on-site or off-site renewable electric systems and/or on-site renewable thermal systems

Possible Points: 1 - 3

Renewable Energy

RE1 Renewable energy systems

Additional Requirements:

- Located in NYISO territory
- Allocation
- Renewable Energy Credits (RECs)
  - Not required for systems <25kw
- Annual reporting
- Enforcement

RE2 Renewable Energy Biomass

Biomass space heating systems can reduce GHG emissions dramatically.

Requirement:
Approved biomass heating systems. No fossil fuels used for HVAC system.

Possible Points: 3 – 5
3 points (Commercial)
5 points (Residential)

Other Points

OP1 Development Density

Households and business located in closer proximity to each other can be better served by public transit and car sharing programs.

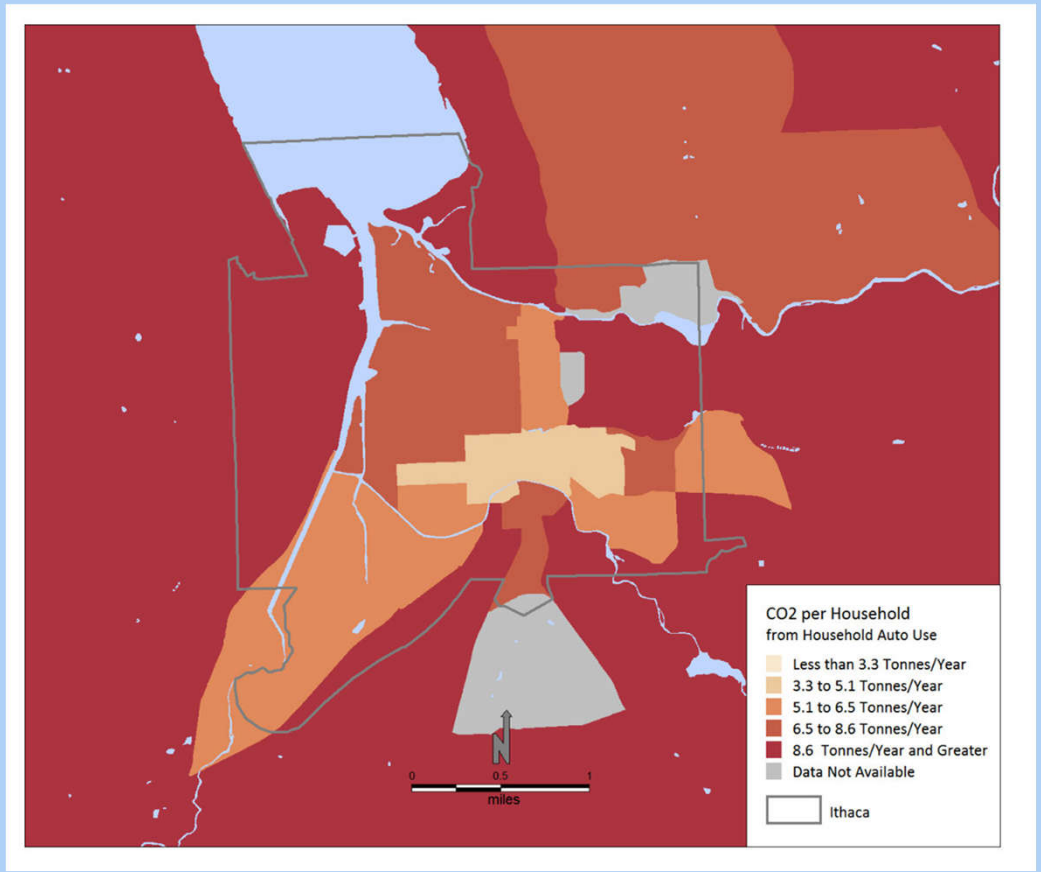
Requirement:
Residential Density > 7 dwelling units/acre
Commercial Density > 7,000 square ft/acre

Possible Points: 1
A max. of two points may be earned for OP1, OP2, and OP3 combined

Other Points

OP2 Walkability

Households located outside the core of the city (not walkable to services) generate almost 3 times as much CO_2 due to increased dependency on vehicle trips.



Requirement:
Building located within ¼ mile of 5 Neighborhood Amenities OR located within a Town development priority area

Possible Points: 1
A max. of two points may be earned for OP1, OP2, and OP3 combined

Other Points

OP3 Electric Vehicle Parking Spaces

Electric Vehicle charging equipment enables electrification of necessary vehicle trips.

Requirement:
Install EV charging stations and parking spots based on size of building

Possible Points: 1
A max. of two points may be earned for OP1, OP2, and OP3 combined

Other Points

OP4 Adaptive reuse

It can take 10 to 80 years for a new energy efficient building to overcome, through efficient operations, the climate change impacts created by its construction.

Requirement:
Re-purpose existing building *for a different use*. Maintains at least 50% of the existing building structure and envelope (based on surface area).

Possible Points: 1

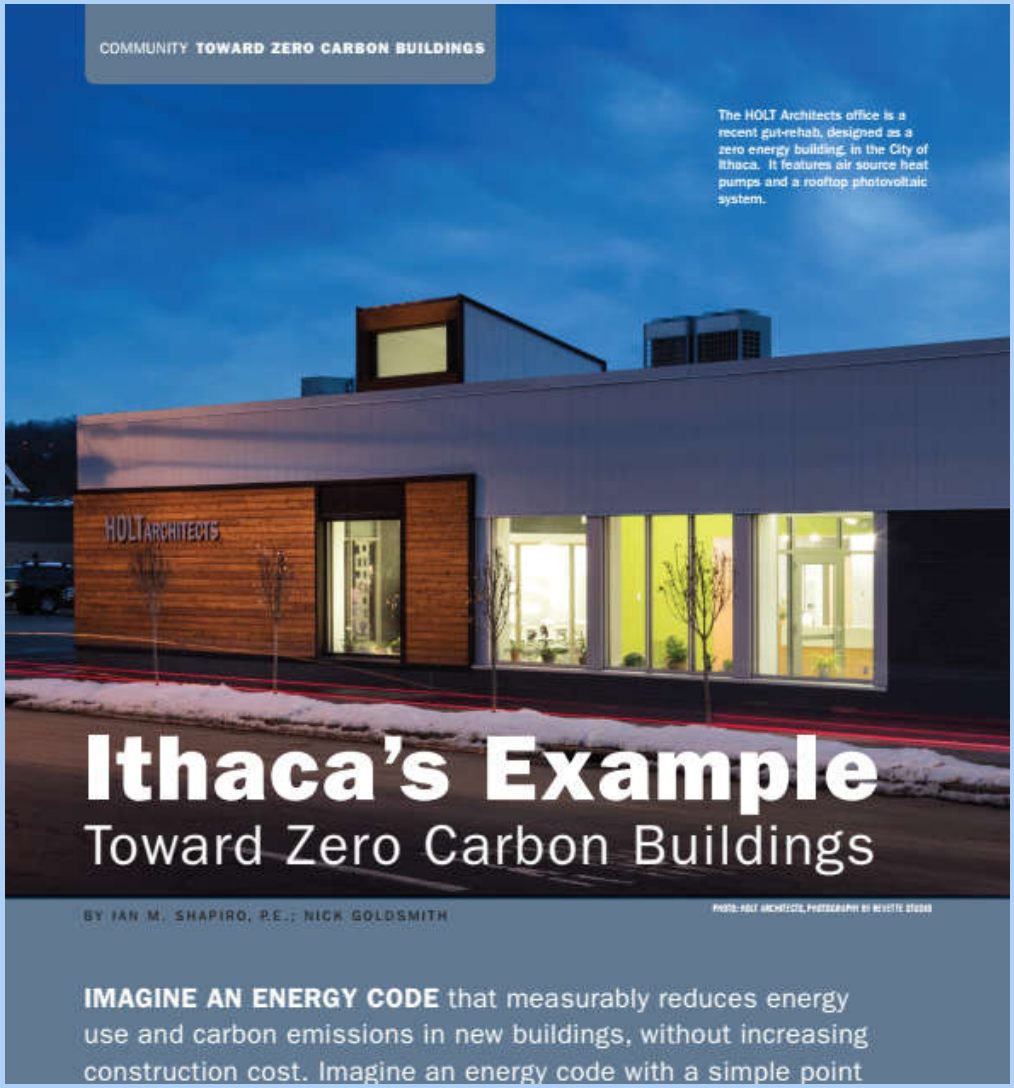


Photo published in High Performing Buildings, Summer 2019. Copyright ASHRAE. Photo: HOLT Architects. Photography by Revette Studio

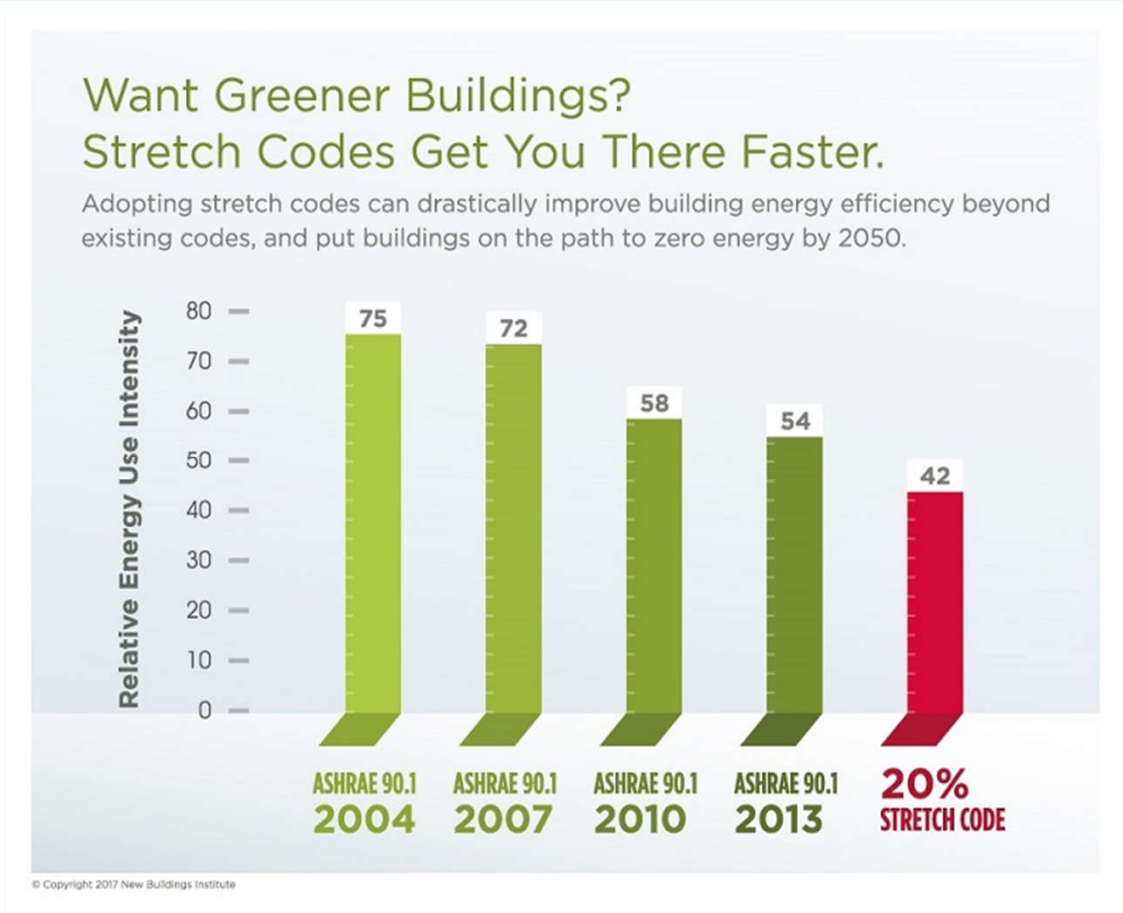
Other Points

OP5 Meet NY Stretch Energy Code

NYSERDA developed NYStretch Code-2020, a voluntary, locally adoptable stretch energy code.

Requirement:
Comply with NY Stretch Energy Code-2020 Ver. 1.0

Possible Points:
1 point (Commercial), 2 points (Residential)



Other Points

OP6 Custom Energy Improvement

Custom solutions may provide savings which can be shown through energy analysis performed by an experienced energy professional.

Requirement:
Reduce energy use by specified amounts AFTER other improvements are accounted for.

Possible Points: 1-2
One point for each 1.2 kwh/sf/yr (Residential) or 2.4 kwh/sf/yr (Commercial) reduction in energy use.

Learn More

- City of Ithaca documents posted at:
  - http://www.cityofithaca.org/135/Codes-Standards
- Town of Ithaca documents posted at:
  - http://www.town.ithaca.ny.us/code-enforcement
- Additional information at project website:
  - www.IthacaGreenBuilding.com

- Ithaca Energy Code Supplement
- Compliance checklists
- Enabling legislation
- Reference document
  - Non-essential information to help understand and use the IECS
  - Background information, commentary, best practices

Thank You!

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